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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,624	08/05/2003	Takashi Kurumisawa	116485	5362

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EXAMINER	
BODDIE, WILLIAM	
ART UNIT	**PAPER NUMBER**
2629	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/633,624	KURUMISAWA ET AL.	
	Examiner	Art Unit	
	William L. Boddie	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In an amendment dated, January 5th, 2007, the Applicant amended claims 1, 5 and 7-11. Currently claims 1-2 and 4-11 are pending.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 5th, 2007 has been entered.

Response to Arguments

3. Applicant's arguments filed January 5th, 2007 have been fully considered but they are not persuasive.

4. On page 12 of the Remarks, the Applicant argues that it would not have been obvious to modify the device of Kim to use the display characteristics for a ±30 degree observing angle due to Kim disclosing grayscale voltages produced form fixed plurality of resistors and that the supplied voltages are based on maximum brightness level and not on viewing angle characteristic.

The Examiner respectfully disagrees, as mentioned in the previously cited portion of Kim, "supplying the first gray level voltages to a first set of pixels to produce a first viewing angle characteristic" (col. 2, lines 16-18). Clearly the grayscale is selected based on a preferred viewing angle and not maximum brightness. Furthermore the

Examiner fails to see why Kim's grayscale voltage generation method would not allow for a 30-degree viewing angle to be achieved.

5. The Applicant additional argues that the combination of Kim with Greier would render Greier unsuitable due to necessary hardware modifications.

The Examiner again respectfully disagrees. Kim specifically states that only the peripheral circuits of the display will need to be adjusted. This is seen as in the spirit of Greier's invention, which states that no alterations are necessary to the "liquid crystal cell, pixel structure, or glass panel." These are clearly not peripheral circuits of a display as described by Kim. As such the combination of Kim with Greier and subsequent art is seen as proper and maintained in this office action.

6. Applicant's remaining arguments with respect to claims 1-2 and 4-11 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 2, 4 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greier et al. (US 6,801,220) in view of Biggs (US 5,866,682) and further in view of Kim et al. (US 5,877,737).

With respect to claim 1, Greier discloses, an image display device, comprising: a display unit, a viewing angle range adjustment device that sets grayscale values of

adjacent pixels of image data so that the grayscale values of the adjacent pixels are different (for the purposes of claim analysis the terms 'grayscale values' and 'luminance' are considered linked, i.e. different grayscale values are akin to different luminance values; [applicant uses the terms interchangeably para. 56-57]. col. 13, lines 11-32, also note the checkerboard pattern of luminance in fig. 20), and a display device for displaying the image data on the display unit (112 in fig. 3).

Greier does not expressly disclose, a resolution conversion device that converts original image data for a single pixel to resolution converted image data including image data of two adjacent pixels, wherein the adjacent pixels have the same grayscale values upon resolution conversion.

Biggs discloses, a resolution conversion device (fig. 2) that converts original image data (fig. a, for example) for a single pixel to resolution converted image data including image data of two adjacent pixels (fig. 4b, for example), each of the adjacent pixels having the same grayscale values. (col. 3, lines 51-63)

At the time of the invention it would have been obvious to one of ordinary skill in the art to convert the incoming video signals of Greier, to automatically copy the image data to fit the resolution of the device as taught by Biggs, and subsequently adjusting the subpixel luminances as taught by Greier.

As to the additional limitation requiring that the resolution conversion be performed prior to adjusting the viewing angle by ensuring a checkered pattern of gray scales, this order of processes is seen as both obvious and required by the combination of devices. The resolution conversion process, of Biggs, essentially introduces

additional data. Greier's device, however, manipulates the grayscale of each pixel to produce a specific pattern of grayscales amongst the pixels (see figs. 13-21).

If the original data were set to the checkered pattern of Greier, and then converted to the screen's resolution, by Biggs, Greier's pattern would be destroyed and the benefits of a wider viewing angle would not be enjoyed. As such it would have been obvious to one of ordinary skill in the art that the resolution conversion process must occur prior to instilling a wider viewing angle in the display data.

The motivation for doing so would have been to quickly resize bitmaps using only minimal processor time (Biggs; col. 2, lines 46-50).

Neither Greier nor Biggs expressly disclose, what occurs in a case that a vertical observation direction to a surface of the display unit is a 0 degree observation direction; the viewing angle range adjustment device sets grayscale value of one of the pixel and the adjacent pixel based on display characteristics of a -30 degrees observation direction and sets grayscale value of the other one of the pixel and the adjacent pixel based on display characteristics of a +30 degrees observation direction.

Kim discloses, in a case that a vertical observation direction to a surface of the display unit is a 0 degree observation direction; the viewing angle range adjustment device sets grayscale value of one of the pixel and the adjacent pixel based on display characteristics of a -30 degrees observation direction and sets grayscale value of the other one of the pixel and the adjacent pixel based on display characteristics of a +30

degrees observation direction (col. 2, lines 14-27, discloses selecting two sets of grayscale values based on producing a widened viewing angle characteristic.)

While Kim does not expressly disclose that a +30 viewing angle characteristic is specifically used in the case of a 0 degree observation direction, this viewing angle is seen as being included in the widened viewing angle disclosed by Kim, as well as an optimum range when selecting a max/min-viewing angle. This angle being optimum it would have been an obvious selection for use in Kim's display.

Biggs, Kim and Greier are all analogous art because they are from the same field of endeavor namely, matrix display control circuitry and methods of displaying data.

At the time of the invention it would have been obvious to one of ordinary skill in the art to select the gray scale values of Greier and Biggs, as taught by Kim.

The motivation for doing so would have been to visually combine the viewing angles so they widen an overall viewing angle of the display (Kim, col. 2, lines 20-23).

Therefore it would have been obvious to combine Greier with Biggs and subsequently with Kim for the benefit of effectively displaying low-res data on a high-res screen and widening viewing angles to obtain the invention as specified in claim 1.

With respect to claim 2, Greier, Kim and Biggs disclose, the image display device according to claim 1 (see above).

Greier further discloses, the viewing angle range adjustment device setting the difference between grayscale values of the adjacent pixels in the vertical direction to be more than a predetermined grayscale value (col. 18, lines 55-58, discusses determining an ideal difference between grayscale values).

With respect to claim 4, Greier, Kim and Biggs disclose, the image display device according to claim 1 (see above).

Greier further discloses, the viewing angle range adjustment device comprising: a lookup table that stores the display characteristics of the display unit (col. 15, lines 12-14), and a device that determines the grayscale value of each pixel with reference to the lookup table (col. 15, lines 14-26).

With respect to claim 10, as claim 10 is simply a method version of claim 1 and offers no new limitations over claim 1, claim 10 is rejected on the same merits as recited above in the rejection of claim 1.

With respect to claim 11, as claim 11 is simply a computer program method version of claim 1 and offers no new limitations over claim 1, claim 11 is rejected on the same merits as recited above in the rejection of claim 1.

9. Claims 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greier et al. (US 6,801,220) in view of Biggs (US 5,886,682).

With respect to claim 5, Greier discloses, an image display device, comprising:

a display unit (fig. 5);

a viewing angle range adjustment device that sets grayscale values of each pixel of image data (col. 13, lines 11-32, also note the checkerboard pattern of luminance in fig. 20), and

a display device for displaying the image data on the display unit (112 in fig. 3); wherein each pixel has sub pixels corresponding to a plurality of colors (fig. 20, one pixel comprises 3 subpixels R,G and B); and

the viewing angle range adjustment device adjusts a viewing angle range for each color of the plurality of colors by setting the grayscale value of one sub pixel of the sub pixels to a different grayscale value than the other sub pixels (note fig. 20 where one subpixel in every pixel has a different grayscale than the other subpixels).

Greier does not expressly disclose, a resolution conversion device that converts original image data for a single pixel to resolution converted image data including image data of two adjacent pixels, wherein the adjacent pixels have the same grayscale values upon resolution conversion.

Biggs discloses, a resolution conversion device (fig. 2) that converts original image data (fig. a, for example) for a single pixel to resolution converted image data including image data of two adjacent pixels (fig. 4b, for example), each of the adjacent pixels having the same grayscale values. (col. 3, lines 51-63)

At the time of the invention it would have been obvious to one of ordinary skill in the art to convert the incoming video signals of Greier, to automatically copy the image data to fit the resolution of the device as taught by Biggs, and subsequently adjusting the subpixel luminances as taught by Greier.

As to the additional limitation requiring that the resolution conversion be performed prior to adjusting the viewing angle by ensuring a checkered pattern of gray scales, this order of processes is seen as both obvious and required by the combination of devices. The resolution conversion process, of Biggs, essentially introduces additional data. Greier's device, however, manipulates the grayscale of each pixel to produce a specific pattern of grayscales amongst the pixels (see figs. 13-21).

If the original data were set to the checkered pattern of Greier, and then converted to the screen's resolution, by Biggs, Greier's pattern would be destroyed and the benefits of a wider viewing angle would not be enjoyed. As such it would have been obvious to one of ordinary skill in the art that the resolution conversion process must occur prior to instilling a wider viewing angle in the display data.

The motivation for doing so would have been to quickly resize bitmaps using only minimal processor time (Biggs; col. 2, lines 46-50).

Therefore it would have been obvious to combine Greier with Biggs for the benefit of efficiently resizing bitmaps to obtain the invention as specified in claim 5.

With respect to claim 6, Greier and Biggs disclose, the image display device according to claim 5 (see above).

Greier further discloses, each subpixel corresponding to each color of R, G and B (fig. 20), the viewing angle range adjustment device comprising: a lookup table that stores display characteristics of the display unit for each color of R, G, and B; and a device that determines the grayscale values of the sub pixels for each color with reference to the lookup table (col. 19, lines 37-40, which details operations based on stored RGB values).

With respect to claim 7, Greier discloses, an image display device, comprising:

a display unit;

a viewing angle range adjustment device that sets grayscale values of each pixel of image data (for the purposes of claim analysis the terms 'grayscale values' and 'luminance' are considered linked, i.e. different grayscale values are akin to different

luminance values [applicant uses the terms interchangeably para. 56-57]. col. 13, lines 11-32, also note the checkerboard pattern of luminance in fig. 20), and

a display device for displaying the image data on the display unit (112 in fig. 3) ; wherein each pixel has sub pixels corresponding to a plurality of colors (fig. 20, one pixel comprises 3 subpixels R,G and B); and

the viewing angle range adjustment device adjusts a viewing angle range for each color of the plurality of colors by setting the grayscale value of one pixel to a different grayscale value than the adjacent pixels (note fig. 20 where one subpixel in every pixel has a different grayscale);

an input unit that receives a command to select one of a wide viewing angle range and a narrow viewing angle range, the display device displays the image data adjusted by the viewing angle range adjustment device if the wide viewing angle range mode is selected and displays the image data not adjusted by the viewing angle range mode if the narrow viewing angle mode is selected (col. 10, lines 1-3, states the user is allowed to chose the viewing angle range).

Greier does not expressly disclose, a resolution conversion device that converts original image data for a single pixel to resolution converted image data including image data of two adjacent pixels, wherein the adjacent pixels have the same grayscale values upon resolution conversion.

Biggs discloses, a resolution conversion device (fig. 2) that converts original image data (fig. a, for example) for a single pixel to resolution converted image data

including image data of two adjacent pixels (fig. 4b, for example), each of the adjacent pixels having the same grayscale values. (col. 3, lines 51-63)

At the time of the invention it would have been obvious to one of ordinary skill in the art to convert the incoming video signals of Greier, to automatically copy the image data to fit the resolution of the device as taught by Biggs, and subsequently adjusting the subpixel luminances as taught by Greier.

As to the additional limitation requiring that the resolution conversion be performed prior to adjusting the viewing angle by ensuring a checkered pattern of gray scales, this order of processes is seen as both obvious and required by the combination of devices. The resolution conversion process, of Biggs, essentially introduces additional data. Greier's device, however, manipulates the grayscale of each pixel to produce a specific pattern of grayscales amongst the pixels (see figs. 13-21).

If the original data were set to the checkered pattern of Greier, and then converted to the screen's resolution, by Biggs, Greier's pattern would be destroyed and the benefits of a wider viewing angle would not be enjoyed. As such it would have been obvious to one of ordinary skill in the art that the resolution conversion process must occur prior to instilling a wider viewing angle in the display data.

The motivation for doing so would have been to quickly resize bitmaps using only minimal processor time (Biggs; col. 2, lines 46-50).

Therefore it would have been obvious to combine Greier with Biggs for the benefit of efficiently resizing bitmaps to obtain the invention as specified in claim 7.

With respect to claim 8, as claim 8 is simply a method claim and offers no new limitations over claim 5, claim 8 is rejected on the same merits as recited above in the rejection of claim 5.

With respect to claim 9, as claim 9 is simply a computer program method claim and offers no new limitations over claim 5, claim 9 is rejected on the same merits as recited above in the rejection of claim 5.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William L. Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wlb
1/29/07

AMR A. AWAD
SUPERVISORY PATENT EXAMINER